


Solving Similar Triangle Problems

If $\triangle XYZ \sim \triangle ABC$,
and n is the scale factor, then

$$n = \frac{AB}{XY}$$

of
ar triangles.



on

For example,

- distances across rivers and canyons
- heights of tall buildings or structures
- distances in outer space.

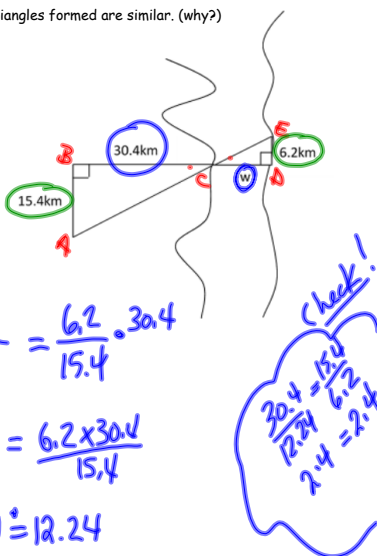
Steps:

1. Show triangles are similar using:
SSS~, SAS~, or AA~
2. Use properties of similar triangles to determine unknown quantities:
 - corresponding angles are equal
 - corresponding sides are proportional

$$\text{If } \triangle ABC \sim \triangle XYZ, \quad \frac{AB}{XY} = \frac{BC}{YZ} = \frac{AC}{XZ} \quad \begin{array}{l} \angle A = \angle X \\ \angle B = \angle Y \\ \angle C = \angle Z \end{array}$$

The two right triangles formed are similar. (why?)

$\angle B = \angle D$ (give)
 $\angle ACB = \angle ECD$ (OAT)
 $\therefore \Delta$'s are similar
 by AA



\therefore the river is 12.24 km wide

$$W = \frac{6,2 \times 30,4}{15,4}$$
$$W = 12,24$$

The two right triangles formed are similar. (why?) $AA \sim$

1. Angle of incident and reflection are the same (law of reflection) $i = r$

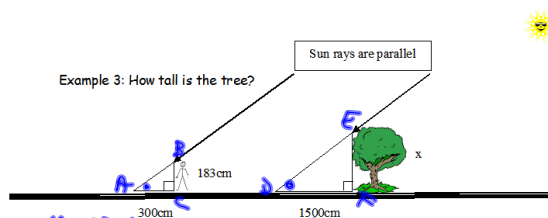
$$\frac{a}{160} = \frac{300}{200}$$

$$a = \frac{300 \times 160}{200}$$

$$A = 240$$

\therefore the height of the room is 240 cm.

Example 3: How tall is the tree?



Assigned Work: p.386 # 4, 6, 9, 12, 14*

$\angle A = \angle D$ (sun rays are parallel)
 $\angle C = \angle F$ (given) 90°
 $\therefore \Delta$'s are similar
 by AA

\therefore the height of the
 tree is 915cm

$$\frac{x}{183} = \frac{1500}{300}$$

$$x = \frac{1500 \times 183}{300}$$

$$x = 915$$